General

Guideline Title

Hypertension. Clinical management of primary hypertension in adults.

Bibliographic Source(s)

National Clinical Guideline Centre. Hypertension. Clinical management of primary hypertension in adults. London (UK): National Institute for Health and Clinical Excellence (NICE); 2011 Aug. 36 p. (Clinical guideline; no. 127).

Guideline Status

This is the current release of the guideline.

This guideline updates previous versions:

National Collaborating Centre for Chronic Conditions. Hypertension. Management of hypertension in adults in primary care: partial update. London (UK): Royal College of Physicians; 2006. 94 p.

North of England Hypertension Guideline Development Group. Essential hypertension: managing adult patients in primary care. Newcastle upon Tyne (UK): Centre for Health Services Research, University of Newcastle; 2004 Aug. 261 p.

Recommendations

Major Recommendations

Note from the National Guideline Clearinghouse (NGC): The original 2004 guideline was developed by the Newcastle Guideline Development and Research Unit. The guideline was updated by the National Clinical Guideline Centre (NCGC) (formerly the National Collaborating Centre for Chronic Conditions [NCC-CC]) in collaboration with the British Hypertension Society (BHS) in 2006 and 2011. See the "Availability of Companion Documents" field for the full version of this guidance.

In this guideline the following definitions are used.

- Stage 1 hypertension: Clinic blood pressure is 140/90 mmHg or higher and subsequent ambulatory blood pressure monitoring (ABPM) daytime average or home blood pressure monitoring (HBPM) average blood pressure is 135/85 mmHg or higher.
- Stage 2 hypertension: Clinic blood pressure is 160/100 mmHg or higher and subsequent ABPM daytime average or HBPM average blood pressure is 150/95 mmHg or higher.
- Severe hypertension: Clinic systolic blood pressure is 180 mmHg or higher or clinic diastolic blood pressure is 110 mmHg or higher.

Measuring Blood Pressure (BP)

Healthcare professionals taking blood pressure measurements need adequate initial training and periodic review of their performance. [2004]

Because automated devices may not measure blood pressure accurately if there is pulse irregularity (for example, due to atrial fibrillation), palpate the radial or brachial pulse before measuring blood pressure. If pulse irregularity is present, measure blood pressure manually using direct auscultation over the brachial artery. [new 2011]

Healthcare providers must ensure that devices for measuring blood pressure are properly validated, maintained, and regularly recalibrated according to manufacturers' instructions. [2004]

When measuring blood pressure in the clinic or in the home, standardise the environment and provide a relaxed, temperate setting, with the person quiet and seated, and their arm outstretched and supported. [new 2011]

If using an automated blood pressure monitoring device, ensure that the device is validated* and an appropriate cuff size for the person's arm is used. [new 2011]

*A list of validated blood pressure monitoring devices is available on the British Hypertension Society's Web site . The British Hypertension Society is an independent reviewer of published work. This does not imply any endorsement by NICE.

In people with symptoms of postural hypotension (falls or postural dizziness):

- Measure blood pressure with the person either supine or seated
- Measure blood pressure again with the person standing for at least 1 minute prior to measurement. [2004, amended 2011]

If the systolic blood pressure falls by 20 mmHg or more when the person is standing:

- Review medication
- Measure subsequent blood pressures with the person standing
- Consider referral to specialist care if symptoms of postural hypotension persist. [2004, amended 2011]

Diagnosing Hypertension

When considering a diagnosis of hypertension, measure blood pressure in both arms.

- If the difference in readings between arms is more than 20 mmHg, repeat the measurements.
- If the difference in readings between arms remains more than 20 mmHg on the second measurement, measure subsequent blood pressures in the arm with the higher reading. [new 2011]

If blood pressure measured in the clinic is 140/90 mmHg or higher:

- Take a second measurement during the consultation.
- If the second measurement is substantially different from the first, take a third measurement.

Record the lower of the last two measurements as the clinic blood pressure. [new 2011]

If the clinic blood pressure is 140/90 mmHg or higher, offer ambulatory blood pressure monitoring (ABPM) to confirm the diagnosis of hypertension. [new 2011]

If a person is unable to tolerate ABPM, home blood pressure monitoring (HBPM) is a suitable alternative to confirm the diagnosis of hypertension. [new 2011]

If the person has severe hypertension, consider starting antihypertensive drug treatment immediately, without waiting for the results of ABPM or HBPM. [new 2011]

While waiting for confirmation of a diagnosis of hypertension, carry out investigations for target organ damage (such as left ventricular hypertrophy, chronic kidney disease and hypertensive retinopathy) (see 'Assessing Cardiovascular Risk and Target Organ Damage' below) and a formal assessment of cardiovascular risk using a cardiovascular risk assessment tool (see 'Assessing Cardiovascular Risk and Target Organ Damage' below). [new 2011]

If hypertension is not diagnosed but there is evidence of target organ damage such as left ventricular hypertrophy, albuminuria or proteinuria, consider carrying out investigations for alternative causes of the target organ damage. [new 2011]

If hypertension is not diagnosed, measure the person's clinic blood pressure at least every 5 years subsequently, and consider measuring it more

frequently if the person's clinic blood pressure is close to 140/90 mmHg. [new 2011]

When using ABPM to confirm a diagnosis of hypertension, ensure that at least two measurements per hour are taken during the person's usual waking hours (for example, between 08:00 and 22:00). Use the average value of at least 14 measurements taken during the person's usual waking hours to confirm a diagnosis of hypertension. [new 2011]

When using HBPM to confirm a diagnosis of hypertension, ensure that:

- For each blood pressure recording, two consecutive measurements are taken, at least 1 minute apart and with the person seated and
- Blood pressure is recorded twice daily, ideally in the morning and evening and
- Blood pressure recording continues for at least 4 days, ideally for 7 days.

Discard the measurements taken on the first day and use the average value of all the remaining measurements to confirm a diagnosis of hypertension. [new 2011]

Refer the person to specialist care the same day if they have:

- Accelerated hypertension, that is, blood pressure usually higher than 180/110 mmHg with signs of papilloedema and/or retinal haemorrhage or
- Suspected phaeochromocytoma (labile or postural hypotension, headache, palpitations, pallor and diaphoresis). [2004, amended 2011]

Consider the need for specialist investigations in people with signs and symptoms suggesting a secondary cause of hypertension. [2004, amended 2011]

Assessing Cardiovascular Risk and Target Organ Damage

For the National Institute for Health and Clinical Excellence (NICE) guidance on the early identification and management of chronic kidney disease see Chronic kidney disease (NICE clinical guideline 73).

Use a formal estimation of cardiovascular risk to discuss prognosis and healthcare options with people with hypertension, both for raised blood pressure and other modifiable risk factors. [2004]

Estimate cardiovascular risk in line with the recommendations on Identification and assessment of cardiovascular disease (CVD) risk in Lipid modification (NICE clinical guideline 67).* [2008]

*Clinic blood pressure measurements must be used in the calculation of cardiovascular risk.

For all people with hypertension offer to:

- Test for the presence of protein in the urine by sending a urine sample for estimation of the albumin:creatinine ratio and test for haematuria using a reagent strip.
- Take a blood sample to measure plasma glucose, electrolytes, creatinine, estimated glomerular filtration rate, serum total cholesterol and HDL cholesterol.
- Examine the fundi for the presence of hypertensive retinopathy.
- Arrange for a 12-lead electrocardiograph to be performed. [2004, amended 2011]

Lifestyle Interventions

Lifestyle advice should be offered initially and then periodically to people undergoing assessment or treatment for hypertension. [2004]

Ascertain people's diet and exercise patterns because a healthy diet and regular exercise can reduce blood pressure. Offer appropriate guidance and written or audiovisual materials to promote lifestyle changes. [2004]

Relaxation therapies can reduce blood pressure and people may wish to pursue these as part of their treatment. However, routine provision by primary care teams is not currently recommended. [2004]

Ascertain people's alcohol consumption and encourage a reduced intake if they drink excessively, because this can reduce blood pressure and has broader health benefits. [2004]

Discourage excessive consumption of coffee and other caffeine-rich products. [2004]

Encourage people to keep their dietary sodium intake low, either by reducing or substituting sodium salt, as this can reduce blood pressure. [2004]

Do not offer calcium, magnesium or potassium supplements as a method for reducing blood pressure. [2004]

Offer advice and help to smokers to stop smoking. [2004]

A common aspect of studies for motivating lifestyle change is the use of group working. Inform people about local initiatives by, for example, healthcare teams or patient organisations that provide support and promote healthy lifestyle change. [2004]

Initiating and Monitoring Antihypertensive Drug Treatment, Including Blood Pressure Targets

Initiating Treatment

Offer antihypertensive drug treatment to people aged under 80 years with stage 1 hypertension who have one or more of the following:

- Target organ damage
- Established cardiovascular disease
- Renal disease
- Diabetes
- A 10-year cardiovascular risk equivalent to 20% or greater [new 2011]

Offer antihypertensive drug treatment to people of any age with stage 2 hypertension. [new 2011]

For people aged under 40 years with stage 1 hypertension and no evidence of target organ damage, cardiovascular disease, renal disease or diabetes, consider seeking specialist evaluation of secondary causes of hypertension and a more detailed assessment of potential target organ damage. This is because 10-year cardiovascular risk assessments can underestimate the lifetime risk of cardiovascular events in these people. [new 2011]

Monitoring Treatment and Blood Pressure Targets

Use clinic blood pressure measurements to monitor the response to antihypertensive treatment with lifestyle modifications or drugs. [new 2011]

Aim for a target clinic blood pressure below 140/90 mmHg in people aged under 80 years with treated hypertension. [new 2011]

Aim for a target clinic blood pressure below 150/90 mmHg in people aged 80 years and over, with treated hypertension. [new 2011]

For people identified as having a 'white-coat effect'*, consider ABPM or HBPM as an adjunct to clinic blood pressure measurements to monitor the response to antihypertensive treatment with lifestyle modification or drugs. [new 2011]

When using ABPM or HBPM to monitor the response to treatment (for example, in people identified as having a 'white-coat effect'* and people who choose to monitor their blood pressure at home), aim for a target average blood pressure during the person's usual waking hours of:

- Below 135/85 mmHg for people aged under 80 years
- Below 145/85 mmHg for people aged 80 years and over [new 2011]

*A discrepancy of more than 20/10 mmHg between clinic and average daytime ABPM or average HBPM blood pressure measurements at the time of diagnosis.

Choosing Antihypertensive Drug Treatment

Where possible, recommend treatment with drugs taken only once a day. [2004]

Prescribe non-proprietary drugs where these are appropriate and minimise cost. [2004]

Offer people with isolated systolic hypertension (systolic blood pressure 160 mmHg or more) the same treatment as people with both raised systolic and diastolic blood pressure. [2004]

Offer people aged 80 years and over the same antihypertensive drug treatment as people aged 55–80 years, taking into account any comorbidities. [new 2011]

Offer antihypertensive drug treatment to women of child-bearing potential in line with the recommendations on 'Management of pregnancy with chronic hypertension' and 'Breastfeeding' in the NICE guideline Hypertension in pregnancy. [2010]

Step 1 Treatment

Offer people aged under 55 years step 1 antihypertensive treatment with an angiotensin-converting enzyme (ACE) inhibitor or a low-cost angiotensin-II receptor blocker (ARB). If an ACE inhibitor is prescribed and is not tolerated (for example, because of cough), offer a low-cost ARB. [new 2011]

Do not combine an ACE inhibitor with an ARB to treat hypertension. [new 2011]

Offer step 1 antihypertensive treatment with a calcium-channel blocker (CCB) to people aged over 55 years and to black people of African or Caribbean family origin of any age. If a CCB is not suitable, for example because of oedema or intolerance, or if there is evidence of heart failure or a high risk of heart failure, offer a thiazide-like diuretic. [new 2011]

If diuretic treatment is to be initiated or changed, offer a thiazide-like diuretic, such as chlortalidone (12.5–25.0 mg once daily) or indapamide (1.5 mg modified-release once daily or 2.5 mg once daily) in preference to a conventional thiazide diuretic such as bendroflumethiazide or hydrochlorothiazide. [new 2011]

For people who are already having treatment with bendroflumethiazide or hydrochlorothiazide and whose blood pressure is stable and well controlled, continue treatment with the bendroflumethiazide or hydrochlorothiazide. [new 2011]

Beta-blockers are not a preferred initial therapy for hypertension. However, beta-blockers may be considered in younger people, particularly:

- Those with an intolerance or contraindication to ACE inhibitors and angiotensin II receptor antagonists or
- Women of child-bearing potential or
- People with evidence of increased sympathetic drive [2006]

If therapy is initiated with a beta-blocker and a second drug is required, add a calcium-channel blocker rather than a thiazide-like diuretic to reduce the person's risk of developing diabetes. [2006]

Step 2 Treatment

If blood pressure is not controlled by step 1 treatment, offer step 2 treatment with a CCB in combination with either an ACE inhibitor or an ARB.* [new 2011]

If a CCB is not suitable for step 2 treatment, for example because of oedema or intolerance, or if there is evidence of heart failure or a high risk of heart failure, offer a thiazide-like diuretic. [new 2011]

For black people of African or Caribbean family origin, consider an ARB* in preference to an ACE inhibitor, in combination with a CCB. [new 2011]

*Choose a low-cost ARB.

Step 3 Treatment

Before considering step 3 treatment, review medication to ensure step 2 treatment is at optimal or best tolerated doses. [new 2011]

If treatment with three drugs is required, the combination of ACE inhibitor or angiotensin II receptor blocker, calcium-channel blocker and thiazide-like diuretic should be used. [2006]

Step 4 Treatment

Regard clinic blood pressure that remains higher than 140/90 mmHg after treatment with the optimal or best tolerated doses of an ACE inhibitor or an ARB plus a CCB plus a diuretic as resistant hypertension, and consider adding a fourth antihypertensive drug and/or seeking expert advice. [new 2011]

For treatment of resistant hypertension at step 4:

- Consider further diuretic therapy with low-dose spironolactone (25 mg once daily)* if the blood potassium level is 4.5 mmol/l or lower. Use particular caution in people with a reduced estimated glomerular filtration rate because they have an increased risk of hyperkalaemia.
- Consider higher-dose thiazide-like diuretic treatment if the blood potassium level is higher than 4.5 mmol/l. [new 2011]

*At the time of publication (August 2011), spironolactone did not have UK marketing authorisation for this indication. Informed consent should be obtained and documented.

When using further diuretic therapy for resistant hypertension at step 4, monitor blood sodium and potassium and renal function within 1 month and

repeat as required thereafter. [new 2011]

If further diuretic therapy for resistant hypertension at step 4 is not tolerated, or is contraindicated or ineffective, consider an alpha- or beta-blocker. [new 2011]

If blood pressure remains uncontrolled with the optimal or maximum tolerated doses of four drugs, seek expert advice if it has not yet been obtained. [new 2011]

Patient Education and Adherence to Treatment

Provide appropriate guidance and materials about the benefits of drugs and the unwanted side effects sometimes experienced in order to help people make informed choices. [2004]

People vary in their attitudes to their hypertension and their experience of treatment. It may be helpful to provide details of patient organisations that provide useful forums to share views and information. [2004]

Provide an annual review of care to monitor blood pressure, provide people with support and discuss their lifestyle, symptoms and medication. [2004]

Because evidence supporting interventions to increase adherence is inconclusive, only use interventions to overcome practical problems associated with non-adherence if a specific need is identified. Target the intervention to the need. Interventions might include:

- Suggesting that patients record their medicine-taking
- Encouraging patients to monitor their condition
- Simplifying the dosing regimen
- Using alternative packaging for the medicine
- Using a multi-compartment medicines system

(This recommendation is taken from 'Medicines adherence' [see the NICE guideline Medicines adherence. Involving patients in decisions about prescribed medicines and supporting adherence].) [2009]

Clinical Algorithm(s)

The following algorithms are provided in the original guideline document:

- Care pathway for hypertension
- Summary of antihypertensive drug treatment

Scope

Disease/Condition(s)

Primary hypertension

Note: This guideline does not cover secondary causes of hypertension (for example, Conn's adenoma, phaeochromocytoma and renovascular hypertension).

Guideline Category

Diagnosis

Evaluation

Management

Risk Assessment

Treatment

Clinical Specialty

Cardiology

Family Practice

Internal Medicine

Nursing

Intended Users

Advanced Practice Nurses

Dietitians

Health Care Providers

Hospitals

Nurses

Patients

Physician Assistants

Physicians

Guideline Objective(s)

- To recommend the best available evidence-based treatment options to suppress blood pressure variability in people with hypertension
- To promote good communication between professionals and patients on the relative benefits, risks, harms, and costs of treatments
- To offer best practice advice on the care of adults with hypertension

Target Population

- Adults with hypertension (18 years and older) with particular consideration given to the needs of black people of African and Caribbean family origin and minority ethnic groups where these differ from the needs of the general population.
- People aged 80 years or older

Note: Groups that are not covered include people with diabetes, children and young people (younger than 18 years), pregnant women, secondary causes of hypertension (for example, Conn's adenoma, phaeochromocytoma and renovascular hypertension), people with accelerated hypertension (that is, severe acute hypertension associated grade III retinopathy and encephalopathy), people with acute hypertension or high blood pressure in emergency care settings.

Interventions and Practices Considered

Diagnosis/Evaluation

1. Ensuring adequately trained staff and validated equipment when measuring blood pressure (BP)
2. Palpating radial or brachial pulse before measuring BP
3. Special techniques for persons with symptoms of postural hypotension or if systolic pressure falls by 20 mmHg or more when standing
4. Measuring BP in both arms
5. Second and possibly third measurements if needed

6. Ambulatory blood pressure monitoring (ABPM)
7. Home blood pressure monitoring (HBPM)
8. Assessing for cardiovascular risk and for target organ damage
9. Referral, when appropriate
10. Follow-up visits as needed
11. Special investigations, as appropriate

Management/Treatment

1. Ascertain diet and exercise patterns
2. Guidance and written or audiovisual materials to promote lifestyle changes
3. Encouraging reduced alcohol and coffee/caffeine consumption and reduced sodium intake
4. Advice on how to stop smoking
5. Group working (healthcare teams, patient organizations)
6. Pharmacological treatment:
    - Angiotensin-converting enzyme inhibitors or angiotensin receptor blockers
    - Calcium channel blockers
    - Thiazide-like diuretics
    - Beta-blockers in appropriate populations
    - Spironolactone
    - Combination and stepped treatment as needed
7. Patient education about drug benefits and side effects
8. Annual review of care

Major Outcomes Considered

- Mortality from any cause
- Stroke (ischaemic or haemorrhagic)
- Myocardial infarction (MI) (including, where reported, silent MI)
- Heart failure
- New onset diabetes
- Vascular procedures (including both coronary and carotid artery procedures)
- Angina requiring hospitalisation
- Health-related quality of life
- Major adverse cardiac and cerebrovascular events (MAACE)
- Study drug withdrawal rates (surrogate for adverse effects of drug treatment and for adherence
- Angioedema in black people of African and Caribbean descent
- Blood pressure

Methodology

Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Primary Sources)

Hand-searches of Published Literature (Secondary Sources)

Searches of Electronic Databases

Searches of Unpublished Data

Description of Methods Used to Collect/Select the Evidence

Note from the National Guideline Clearinghouse (NGC): This guideline was developed by the Newcastle Guideline Development and Research Unit and updated by the National Clinical Guideline Centre (formerly the National Collaborating Centre for Chronic Conditions). See the "Availability of Companion Documents" field for the full version of this guidance.

Clinical Literature Search

Systematic literature searches were undertaken to identify evidence within published literature in order to answer the review questions as per The Guidelines Manual (2009). Clinical databases were searched using relevant medical subject headings, free-text terms and study type filters where appropriate. Studies published in languages other than English were not reviewed. All searches were conducted on core databases, MEDLINE, EMBASE, CINAHL and The Cochrane Library. All searches were updated on 29th November 2010 and no papers were included beyond this date.

Search strategies were checked by looking at reference lists of relevant key papers, checking search strategies in other systematic reviews and asking the GDG for known studies. The questions, the study types applied, the databases searched and the years covered can be found in 'Appendix C: Literature search strategies' in the full version of the original guideline document.

During the scoping stage, a search was conducted for guidelines and reports on the websites listed below and via organisations relevant to the topic. Searching for grey literature or unpublished literature was not undertaken. All references sent by stakeholders were considered.

- Guidelines International Network database (www.g-i-n.net)
- National Guideline Clearinghouse (www.guideline.gov/)
- National Institute for Health and Clinical Excellence (NICE) (www.nice.org.uk)
- National Institutes of Health Consensus Development Program (consensus.nih.gov/)
- National Library for Health (www.library.nhs.uk/)

Call for Evidence

The GDG decided to initiate a 'call for evidence' for meta-analyses, based on a systematic review, that include studies that use ambulatory blood pressure measurement as the reference standard and report sensitivity and specificity of home and/or clinic blood pressure measurement, as they believed that important evidence existed that would not be identified by the standard searches. The NCGC contacted all registered stakeholders and asked them to submit any relevant published or unpublished evidence.

Inclusion/Exclusion

See 'Appendix E: Review protocols' in the full version of the original guideline document for further details.

The Research Fellow:

- Identified potentially relevant studies for each review question from the relevant search results by reviewing titles and abstracts – full papers were then obtained.
- Reviewed full papers against pre-specified inclusion/exclusion criteria to identify studies that addressed the review question in the appropriate population and reported on outcomes of interest (review protocols are included in 'Appendix E: Review protocols' in the full version of the original guideline document).

Health Economic Literature Search

Systematic literature searches were also undertaken to identify health economic evidence within published literature relevant to the review questions. The evidence was identified by conducting a broad search relating to the guideline population in the National Health Service Economic Evaluation Database (NHS EED), the Health Economic Evaluations Database (HEED) and health technology assessment (HTA) databases from 2003 onwards to find anything published since the original guideline. There were two questions not covered in either the original guideline or the previous rapid update, for which additional searches with no date restrictions were carried out. Additionally, the search was run on MEDLINE and EMBASE, with a specific economic filter, from 2009, to ensure recent publications that had not yet been indexed by these databases were identified. Studies published in languages other than English were not reviewed. Where possible, searches were restricted to articles published in English language. The search strategies for health economics are included in 'Appendix D: Literature search strategies' in the full version of the original guideline document. All searches were updated on 29th November 2010. No papers published after this date were considered.

Call for Evidence

The GDG decided to initiate a 'call for evidence' for cost-effectiveness analyses from a United Kingdom (UK) perspective, using methods in line

with the NICE reference case, comparing ambulatory, home and clinic blood pressure measurement in the diagnosis of hypertension, as they believed that important evidence existed that would not be identified by the standard searches. The NCGC contacted all registered stakeholders and asked them to submit any relevant published or unpublished evidence.

Inclusion/Exclusion

Full economic evaluations (studies comparing costs and health consequences of alternative courses of action: cost-utility, cost-effectiveness, cost-benefit and cost-consequence analyses) and comparative costing studies that addressed the review question in the relevant population were considered potentially applicable as economic evidence.

Studies were excluded if they only reported cost per hospital (not per patient), or only reported average cost effectiveness without disaggregated costs and effects. Abstracts, posters, reviews, letters/editorials, foreign language publications and unpublished studies were excluded. Studies judged to have an applicability rating of 'not applicable' were excluded (this included studies that took the perspective of a non-Organisation for Economic Co-operation and Development [OECD] country).

Remaining studies were prioritised for inclusion based on their relative applicability to the development of this guideline and the study limitations. For example, if a high quality, directly applicable UK analysis was available other less relevant studies may have been excluded and this is noted in the relevant section.

For more details about the assessment of applicability and methodological quality see the economic evaluation checklist (The Guidelines Manual, Appendix H and the health economics research protocol in 'Appendix E: Review protocols' in the full version of the original guideline document.

When no relevant economic analyses were identified in the economic literature review, relevant UK NHS unit costs were presented to the GDG to inform consideration of cost effectiveness.

Number of Source Documents

Not stated

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Overall Quality of Outcome Evidence in Grading of Recommendations Assessment, Development and Evaluation (GRADE)

Level	Description
High	Further research is very unlikely to change confidence in the estimate of effect
Moderate	Further research is likely to have an important impact on confidence in the estimate of effect and may change the estimate
Low	Further research is very likely to have an important impact on confidence in the estimate of effect and is likely to change the estimate
Very low	Any estimate of effect is very uncertain

Methods Used to Analyze the Evidence

Meta-Analysis of Randomized Controlled Trials

Review of Published Meta-Analyses

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

Note from the National Guideline Clearinghouse (NGC): This guideline was developed by the Newcastle Guideline Development and Research Unit and updated by the National Clinical Guideline Centre (formerly the National Collaborating Centre for Chronic Conditions) and the British Hypertension Society. See the "Availability of Companion Documents" field for the full version of this guidance.

Evidence of Effectiveness

The Research Fellow:

- Critically appraised relevant studies using the appropriate checklist as specified in The Guidelines Manual
- Extracted key information about the study's methods and results into evidence tables (evidence tables are included in 'Appendix D: Evidence tables – clinical studies' and 'Appendix G: Evidence tables – health economic studies' in the full version of the original guideline document.
- Generated summaries of the evidence by outcome (included in the relevant chapter write-ups):
    - Randomised studies: meta analysed, where appropriate and reported in Grading of Recommendations Assessment, Development and Evaluation (GRADE) profiles (for clinical studies)
    - Observational studies: data has been presented for individual studies narratively or in summary tables (GRADE profiles have not been generated)
    - Diagnostic studies: data has been presented for individual studies narratively or in summary tables (GRADE profiles have not been generated)
    - Qualitative studies: each study summarised in a table where possible, otherwise presented in a narrative.

Data Synthesis for Intervention Reviews

Where possible, meta-analyses were conducted to combine the results of studies for each review question using Cochrane Review Manager (RevMan5) software. Fixed-effects (Mantel-Haenszel) techniques were used to calculate risk ratios (relative risk) for the following binary outcomes: angioedema. Where reported, time-to-event data was presented as a hazard ratio for the following binary outcomes: mortality, stroke, MI, heart failure, new onset diabetes, vascular procedures, angina requiring hospitalisation, study drug withdrawal. The continuous outcome blood pressure (mmHg)] was analysed using an inverse variance method for pooling weighted mean differences and where the studies had different scales, standardised mean differences were used. No quality of life outcome data was reported by any of the studies included in the 2012 update reviews.

Statistical heterogeneity was assessed by considering the chi-squared test for significance at $p<0.1$ or an I-squared inconsistency statistic of >50% to indicate significant heterogeneity. Where significant heterogeneity was present, we carried out sensitivity analysis based on the quality of studies, with particular attention paid to allocation concealment, blinding and loss to follow-up (missing data). In cases where there was inadequate allocation concealment, unclear blinding, high loss to follow-up (≥20% missing data for studies ≤2 years follow-up and ≥30% for those with >2 years follow-up) or differential missing data, this was examined in a sensitivity analysis. For the latter, the duration of follow up was also taken into consideration prior to including in a sensitivity analysis.

Assessments of potential differences in effect between subgroups were based on the chi-squared tests for heterogeneity statistics between subgroups. If no sensitivity analysis was found to completely resolve statistical heterogeneity then a random effects (DerSimonian and Laird) model was also explored to provide a more conservative estimate of the effect.

The means and standard deviations of continuous outcomes were required for meta-analysis. However, in cases where standard deviations were not reported, the standard error was calculated if the p-values or 95% confidence intervals were reported and meta-analysis was undertaken with the mean and standard error using the generic inverse variance method in Cochrane Review Manager (RevMan5) software. Where p values were reported as 'less than', a conservative approach was undertaken. For example, if the p value was reported as '$p\leq0.001$', the calculations for standard deviations will be based on a p value of 0.001. If these statistical measures were un available then the methods described in section 16.1.3 of the Cochrane Handbook 'Missing standard deviations' were applied as the last resort.

Appraising the Quality of Evidence by Outcomes

The evidence for outcomes from the included randomised clinical trial (RCT) studies were evaluated and presented using an adaptation of the 'Grading of Recommendations Assessment, Development and Evaluation (GRADE) toolbox' developed by the international GRADE working group (http://www.gradeworkinggroup.org/). The software (GRADEpro) developed by the GRADE working group was used to assess the quality of each outcome, taking into account individual study quality and the meta-analysis results. The summary of findings was presented as an 'evidence profile', a single table that includes details of the quality assessment as well as pooled outcome data, where appropriate, an absolute measure of intervention effect and the summary of quality of evidence for that outcome. In this table, the columns for intervention and

control indicate the sum of the sample size for continuous outcomes. For binary outcomes such as number of patients with an adverse event, the event rates (n/N: number of patients with events divided by sum of number of patients) are shown with percentages. Reporting or publication bias was only taken into consideration in the quality assessment and included in the Clinical Study Characteristics table if it was apparent.

Each outcome was examined separately for the quality elements listed and defined in Table 1 and each graded using the quality levels listed in Table 2: 'The main criteria considered in the rating of these elements in the full version of the original guideline document. Footnotes were used to describe reasons for grading a quality element as having serious or very serious problems. The ratings for each component were summed to obtain an overall assessment for each outcome.

Grading the Quality of Clinical Evidence

After results were pooled, the overall quality of evidence for each outcome was considered. The procedure adopted when using GRADE is specified in the full version of the original guideline document, as are the methods of dealing with study limitations, inconsistencies, indirectness, and imprecision.

Prognostic Studies

All prognostic study designs were included for the prognostic questions. The quality of the prognostic studies was assessed using the quality checklist in the NICE Guidelines Manual April 2009. The main criteria considered in assessing study quality were:

- The study sample represents the population of interest with regard to key characteristics, sufficient to limit potential bias to the results.
- Loss to follow-up is unrelated to key characteristics (that is, the study data adequately represent the sample), sufficient to limit potential bias.
- The prognostic factor of interest is adequately measured in study participants, sufficient to limit potential bias.
- The outcome of interest is adequately measured in study participants, sufficient to limit bias.
- Important potential confounders are appropriately accounted for, limiting potential bias with respect to the prognostic factor of interest.
- The statistical analysis is appropriate for the design of the study, limiting potential for the presentation of invalid results.

The methodological flaws of the prognostic studies included in the guideline update have been summarised in tables within Appendix F in the full version of the original guideline document, in order to give an overview of the quality of each individual study, since GRADE is not currently designed for prognostic studies. Odds ratios, relative risks or hazard ratios, with their 95% confidence intervals, from multivariate analyses were extracted from the papers. Data for selected outcomes has been summarised in tables within the relevant review chapter. Full data for all the outcomes has been reported in the evidence tables (see Appendix F in the full version of the original guideline document) for each individual prognostic study. Taking into consideration the advice on prognostic reviews in the NICE guidelines manual, meta-analysis was not undertaken for prognostic studies.

Evidence of Cost Effectiveness

The Health Economist:

- Identified potentially relevant studies for each review question from the economic search results by reviewing titles and abstracts – full papers were then obtained.
- Reviewed full papers against pre-specified inclusion/exclusion criteria to identify relevant studies (see below for details).
- Critically appraised relevant studies using the economic evaluations checklist as specified in The Guidelines Manual.
- Extracted key information about the study's methods and results into evidence tables (evidence tables are included in 'Appendix G: Evidence tables – health economic studies' in the full version of the original guideline document).
- Generated summaries of the evidence in NICE economic evidence profiles (included in the relevant chapter write-ups) – see below for details.

NICE Economic Evidence Profiles

The NICE economic evidence profile has been used to summarise cost and cost-effectiveness estimates. The economic evidence profile shows, for each economic study, an assessment of applicability and methodological quality, with footnotes indicating the reasons for the assessment. These assessments were made by the health economist using the economic evaluation checklist from The Guidelines Manual, Appendix H. It also shows incremental costs, incremental outcomes (for example, quality-adjusted life years [QALYs]) and the incremental cost-effectiveness ratio from the primary analysis, as well as information about the assessment of uncertainty in the analysis. See Table 7 in the full version of the original guideline document for more details.

If a non-UK study was included in the profile, the results were converted into pounds sterling using the appropriate purchasing power parity.

Undertaking New Health Economic Analysis

As well as reviewing the published economic literature for each review question, as described above, new cost-effectiveness analysis was undertaken by the Health Economist in priority areas. Priority areas were agreed by the GDG after formation of the review questions and consideration of the available health economic evidence.

Additional data for the analysis were identified as required through additional literature searches undertaken by the Health Economist, and discussion with the GDG. Model structure, inputs and assumptions were explained to and agreed by the GDG members during meetings, and they commented on subsequent revisions. Results were presented in GDG meetings for discussion and interpretation.

The priority area identified for new economic analysis was diagnosis of hypertension – see 'Appendix J: Cost-effectiveness analysis – blood pressure monitoring for confirming a diagnosis of hypertension (new 2011)' in the full version of the original guideline document for full methods. The 2006 cost-effectiveness analysis of drug treatment was also updated – see 'Appendix I: Cost-effectiveness analysis – pharmacological treatment (updated 2011)' in the full version of the original guideline document for full methods.

See the full version of the original guideline document for additional discussion of cost-effectiveness criteria.

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

Note from the National Guideline Clearinghouse (NGC): This guideline was developed by the Newcastle Guideline Development and Research Unit and updated by the National Clinical Guideline Centre (NCGC; formerly the National Collaborating Centre for Chronic Conditions) and the British Hypertension Society on behalf of National Institute for Health and Clinical Excellence (NICE). See the "Availability of Companion Documents" field for the full version of this guidance.

The guideline development group (GDG) was convened by the NCGC in accordance with guidance from the NICE. The group met every four weeks during the development of the guideline.

Review questions were developed in a PICO framework (patient, intervention, comparison and outcome) for intervention reviews, and with a framework of population, index tests, reference standard and target condition for reviews of diagnostic test accuracy. This was to guide the literature searching process and to facilitate the development of recommendations by the guideline development group (GDG). They were drafted by the National Clinical Guideline Centre (NCGC) technical team and refined and validated by the GDG. The questions were based on the key clinical areas identified in the scope (see 'Appendix A: Scope' and a list can be found in 'Appendix C: Review questions' in the full version of the original guideline document.

Over the course of the guideline development process, the GDG was presented with:

- Evidence tables of the clinical and economic evidence reviewed from the literature. All evidence tables are in 'Appendix E: Evidence Tables – Clinical studies' and 'Appendix G: 'Evidence tables – health economic studies' in the full version of the original guideline document
- Summary of clinical and economic evidence and quality
- Forest plots and summary receiver operating characteristic (ROC) curves
- A description of the methods and results of the cost-effectiveness analysis undertaken for the guideline

Rating Scheme for the Strength of the Recommendations

Not applicable

Cost Analysis

The clinical management of hypertension is one of the most common interventions in primary care, accounting for approximately £1 billion in drug costs alone in 2006.

Cost-Effectiveness of Clinic, Home and Ambulatory Measurements

This analysis of cost-effectiveness found that, confirming a diagnosis of hypertension with ambulatory blood pressure measurement (ABPM) instead of clinic blood pressure measurement (CBPM) or home blood pressure measurement (HBPM) was the most cost-effective option in all age/gender subgroups (40, 50, 60, 70 and 75 years). In fact, ABPM was cost saving compared to CBPM when long term costs were taken into account. The key driver of cost savings with ABPM compared to CBPM was hypertension treatment costs avoided due to more accurate diagnosis (increased specificity). Results are summarised in Table 19 of the full version of the original guideline document.

In most subgroups ABPM was associated with higher quality-adjusted life years (QALYs), as well as lower costs, than CBPM and HBPM (that is ABPM was the dominant option). The exception was in the subgroups with starting age 40 years and the female subgroup with starting age 50 years, where ABPM still had lower costs but was associated with a small reduction in QALYs; however, ABPM was still the most cost effective option in these scenarios.

The conclusion that ABPM is cost-effective compared to CBPM and HBPM was robust to a wide range of sensitivity analyses including those varying the cost of ABPM. As might be expected, the conclusion was sensitive to changes to the accuracy of diagnosis with each method and in some scenarios HBPM became the most cost-effective option. The conclusion was somewhat sensitive to the assumption that check-ups for those diagnosed without hypertension are undertaken every 5 years; in the two lower age subgroups HBPM became cost-effective when check-ups were done annually. The conclusion was also sensitive to the assumption that people who were not hypertensive but were treated did not receive benefits from treatment; when non-hypertensive people also received a risk reduction from treatment, CBPM became the most cost-effective option as there was no benefit to misdiagnosing people.

Treatment of People Aged 80 Years and Greater

One partially applicable study with potentially serious limitations found treating people over 80 years of age with hypertension was cost-effective compared to not treating them.

Monitoring Treatment Efficacy

No cost-effectiveness analyses were identified incorporating all of CBPM, ABPM and HBPM in the assessment of response to treatment.

One partially applicable study with potentially serious limitations found that in a population diagnosed with hypertension using CBPM, monitoring response to treatment and adjusting treatment using HBPM was cost saving compared to CBPM; blood pressure control was however worse.

Treatment Cost-Effectiveness Analysis Conclusions

This analysis found that treating hypertension is highly cost-effective. Treatment resulted in improved health outcomes (higher QALYs) with all of the drug classes in the model and actually resulted in overall cost savings compared to no treatment as the reduction in cardiovascular events led to savings that offset the relatively low cost of antihypertensive medication; although it should be noted that this is based on low cost generic drugs. In most people calcium channel blockers (CCBs) were found to be the most cost-effective treatment option for initial treatment of essential hypertension.

In terms of how the analysis has changed in 2011 since 2006, the most significant change in the model inputs in the 2011 update was the reduction in drugs costs; in particular the cost of CCBs, angiotensin converting enzymes (ACEs) and angiotensin receptor blockers (ARBs). CCBs remained the most cost effective option, meaning no change from 2006 in the interpretation of the base-case result in terms of overall cost effectiveness. The incremental cost effectiveness ratio (ICER) for CCBs did however reduce considerably (from £12,250 to £1,960) making CCBs more cost effective than they were in 2006. CCBs are also no longer the most expensive option, both beta-blockers (B) and no intervention (NI) being more expensive, meaning that CCBs are now cost saving compared to NI; this was not the case in the 2006 guideline. Another key difference is that the absolute difference between ACEs/ARBs, CCBs and thiazide diuretics (TDs) is now much smaller than it was in 2006 with BBs even less cost effective. The results of the subgroup analysis remain largely unchanged apart from that in both men and women, CCBs are cost effective a greater percentage of the time compared with TDs in higher cardiovascular disease (CVD) risk and older age groups; however this difference is not very large. Both old and new analyses show similar trends of cost effectiveness but the new analysis has ACE/ARB cost effective in fewer scenarios than before with the heart failure risk where this is the case moving to intermediate/high risk.

The considerations that were highlighted in the 2006 guideline are still relevant and are described below.

The trials on which the cost-effectiveness calculations are based did not, in general, show large differences in clinical outcomes between drug classes. Some of the outcomes have point estimates of effect that are not statistically significant. In these situations the point estimate is used as the best estimate of effect and so effects that are not statistically significant have a bearing on the relative cost effectiveness. Where the outcomes have a large effect on quality of life or cost (for example, stroke or death) the effect on overall cost effectiveness may be relatively important. The

guideline development group (GDG) considered the effect of this uncertainty about important outcomes in reaching their conclusions. The relative cost effectiveness of the agents also depends on the propensity of patients treated with them to develop new-onset diabetes or heart failure. The GDG were aware that both of these adverse outcomes should be treated with some caution in this context. It is not clear that an elevated blood glucose developing as a consequence of drug treatment has the same long-term health impact as in other circumstances, and the same applies to heart failure diagnoses, particularly since the definition of this outcome in some studies would not satisfy currently accepted criteria.

The applicability of the model to people under the age of 55 is uncertain, since it is based on trial data from mostly older people. However, sensitivity analysis showed that the drugs that affect the renin-angiotensin system are likely to be the most cost-effective option in this group if they are even slightly more effective in the young than is suggested from the overall trial data.

These results are sensitive to the cost of CCBs. The more expensive brands are not likely to be cost effective for use in the NHS. For example, the model estimates that for 65-year-olds at 2% annual CVD risk, 1.1% diabetes risk and 1% heart failure risk CCBs are only cost effective if they cost less than £94 per patient per year.

Finally, it should be emphasised that there is still considerable uncertainty about the size of some treatment effects, which translates into uncertainty about the relative cost-effectiveness of the drugs. The evidence base is also difficult to interpret because of the complex nature of some of the treatment protocols and also because of differences in some of the trial populations.

Method of Guideline Validation

External Peer Review

Internal Peer Review

Description of Method of Guideline Validation

The guideline was validated through two consultations.

1. The first draft of the guideline (the full guideline, National Institute for Health and Clinical Excellence [NICE] guideline, and Quick Reference Guide) were consulted with Stakeholders and comments were considered by the Guideline Development Group (GDG)
2. The final consultation draft of the full guideline, the NICE guideline and the Information for the Public were submitted to stakeholders for final comments.

The final draft was submitted to the Guideline Review Panel for review prior to publication.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of evidence supporting the recommendations is not specifically stated.

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Appropriate clinical management of primary hypertension in adults

Potential Harms

Adverse effects of medication

Contraindications

Contraindications

- Beta-blocker contraindications include asthma and heart block or in combination with a rate-limiting calcium-channel blocker.
- Angiotensin converting enzyme inhibitors and angiotensin receptor blockers are contraindicated in pregnancy.
- Alpha receptor blockers contraindications, cautions, and side-effects vary by drug.

Qualifying Statements

Qualifying Statements

- This guidance represents the view of the National Institute of Health and Clinical Excellence (NICE), which was arrived at after careful consideration of the evidence available. Health professionals are expected to take it fully into account when exercising their clinical judgement. However, the guidance does not override the individual responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or guardian or carer, and informed by the summary of product characteristics of any drugs they are considering.
- Implementation of this guidance is the responsibility of local commissioners and/or providers. Commissioners and providers are reminded that it is their responsibility to implement the guidance, in their local context, in light of their duties to avoid unlawful discrimination and to have regard to promoting equality of opportunity. Nothing in this guidance should be interpreted in a way that would be inconsistent with compliance with those duties.

Implementation of the Guideline

Description of Implementation Strategy

The National Institute for Health and Clinical Excellence (NICE) has developed tools to help organisations implement this guidance (see www.nice.org.uk/guidance/CG127).

Key Priorities for Implementation

The following recommendations have been identified as priorities for implementation.

Diagnosing Hypertension

- If the clinic blood pressure is 140/90 mmHg or higher, offer ambulatory blood pressure monitoring (ABPM) to confirm the diagnosis of hypertension. [new 2011]
- When using ABPM to confirm a diagnosis of hypertension, ensure that at least two measurements per hour are taken during the person's usual waking hours (for example, between 08:00 and 22:00). Use the average value of at least 14 measurements taken during the person's usual waking hours to confirm a diagnosis of hypertension. [new 2011]
- When using home blood pressure monitoring (HBPM) to confirm a diagnosis of hypertension, ensure that:
    - For each blood pressure recording, two consecutive measurements are taken, at least 1 minute apart and with the person seated and
    - Blood pressure is recorded twice daily, ideally in the morning and evening and
    - Blood pressure recording continues for at least 4 days, ideally for 7 days.

Discard the measurements taken on the first day and use the average value of all the remaining measurements to confirm a diagnosis of hypertension. [new 2011]

Initiating and Monitoring Antihypertensive Drug Treatment, Including Blood Pressure Targets

Initiating Treatment

- Offer antihypertensive drug treatment to people aged under 80 years with stage 1 hypertension who have one or more of the following:
  - Target organ damage
  - Established cardiovascular disease
  - Renal disease
  - Diabetes
  - A 10-year cardiovascular risk equivalent to 20% or greater. [new 2011]
- Offer antihypertensive drug treatment to people of any age with stage 2 hypertension. [new 2011]
- For people aged under 40 years with stage 1 hypertension and no evidence of target organ damage, cardiovascular disease, renal disease or diabetes, consider seeking specialist evaluation of secondary causes of hypertension and a more detailed assessment of potential target organ damage. This is because 10-year cardiovascular risk assessments can underestimate the lifetime risk of cardiovascular events in these people. [new 2011]

Monitoring Treatment and Blood Pressure Targets

- For people identified as having a 'white-coat effect' (a discrepancy of more than 20/10 mmHg between clinic and average daytime ABPM or average HBPM blood pressure measurements at the time of diagnosis), consider ABPM or HBPM as an adjunct to clinic blood pressure measurements to monitor the response to antihypertensive treatment with lifestyle modification or drugs. [new 2011]

Choosing Antihypertensive Drug Treatment

- Offer people aged 80 years and over the same antihypertensive drug treatment as people aged 55–80 years, taking into account any comorbidities. [new 2011]

Step 1 Treatment

- Offer step 1 antihypertensive treatment with a calcium-channel blocker (CCB) to people aged over 55 years and to black people of African or Caribbean family origin of any age. If a CCB is not suitable, for example because of oedema or intolerance, or if there is evidence of heart failure or a high risk of heart failure, offer a thiazide-like diuretic. [new 2011]
- If diuretic treatment is to be initiated or changed, offer a thiazide-like diuretic, such as chlortalidone (12.5–25.0 mg once daily) or indapamide (1.5 mg modified-release or 2.5 mg once daily) in preference to a conventional thiazide diuretic such as bendroflumethiazide or hydrochlorothiazide. [new 2011]
- For people who are already having treatment with bendroflumethiazide or hydrochlorothiazide and whose blood pressure is stable and well controlled, continue treatment with the bendroflumethiazide or hydrochlorothiazide. [new 2011]

Step 4 Treatment

- For treatment of resistant hypertension at step 4:
  - Consider further diuretic therapy with low-dose spironolactone* (25 mg once daily) if the blood potassium level is 4.5 mmol/l or lower. Use particular caution in people with a reduced estimated glomerular filtration rate because they have an increased risk of hyperkalaemia.
  - Consider higher-dose thiazide-like diuretic treatment if the blood potassium level is higher than 4.5 mmol/l. [new 2011]

*At the time of publication (August 2011), spironolactone did not have UK marketing authorisation for this indication. Informed consent should be obtained and documented.

Implementation Tools

Audit Criteria/Indicators

Clinical Algorithm

Foreign Language Translations

Patient Resources

Quick Reference Guides/Physician Guides

Slide Presentation

Staff Training/Competency Material

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Living with Illness

IOM Domain

Effectiveness

Patient-centeredness

Identifying Information and Availability

Bibliographic Source(s)

National Clinical Guideline Centre. Hypertension. Clinical management of primary hypertension in adults. London (UK): National Institute for Health and Clinical Excellence (NICE); 2011 Aug. 36 p. (Clinical guideline; no. 127).

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2004 Aug (revised 2011 Aug)

Guideline Developer(s)

British Hypertension Society - Disease Specific Society

National Clinical Guideline Centre - National Government Agency [Non-U.S.]

Source(s) of Funding

National Institute for Health and Clinical Excellence (NICE)

Guideline Committee

Guideline Development Group

Composition of Group That Authored the Guideline

Guideline Development Group Members: Bryan Williams (*Chair*), Professor of Medicine, University of Leicester and University Hospitals of Leicester NHS Trust; Helen Williams, Consultant Pharmacist for Cardiovascular Disease, Southwark Health and Social Care; Jane Northedge, Patient and carer member; John Crimmins, General Practitioner, Vale of Glamorgan; Mark Caulfield, Professor of Clinical Pharmacology, Barts and the London School of Medicine; Michaela Watts, Hypertension Nurse Specialist, Addenbrooke's Hospital, Cambridge; Naomi Stetson, Primary Care Nurse, Watling Medical Centre, London; Richard McManus, Professor of Primary Care Cardiovascular Research, University of Birmingham; Shelley Mason, Patient and carer member; Terry McCormack, General Practitioner, Spring Vale Medical Centre, North Yorkshire

Financial Disclosures/Conflicts of Interest

At the start of the guideline development process all guideline development group (GDG) members declared interests including consultancies, fee-paid work, share-holdings, fellowships and support from the healthcare industry. At all subsequent GDG meetings, members declared arising conflicts of interest. Members were either required to withdraw completely or for part of the discussion if their declared interest made it appropriate. The GDG members' declarations of interests are listed in Appendix B in the full version of the guideline (see the "Availability of Companion Documents" field).

Guideline Status

This is the current release of the guideline.

This guideline updates previous versions:

National Collaborating Centre for Chronic Conditions. Hypertension. Management of hypertension in adults in primary care: partial update. London (UK): Royal College of Physicians; 2006. 94 p.

North of England Hypertension Guideline Development Group. Essential hypertension: managing adult patients in primary care. Newcastle upon Tyne (UK): Centre for Health Services Research, University of Newcastle; 2004 Aug. 261 p.

Guideline Availability

Electronic copies: Available from the National Institute for Health and Clinical Excellence (NICE) Web site .

Availability of Companion Documents

The following are available:

- Hypertension. The clinical management of primary hypertension in adults. Quick reference guide. London (UK): National Institute for Health and Clinical Excellence (NICE); 2011 Aug. 16 p. (Clinical guideline; no. 127). Available in Portable Document Format (PDF) from the National Institute for Health and Clinical Excellence (NICE) Web site .
- Hypertension. The clinical management of primary hypertension in adults. Full guideline. London (UK): National Institute for Health and Clinical Excellence (NICE); 2011 Aug. 614 p. (Clinical guideline; no. 127). Electronic copies: Available in PDF from the NICE Web site .
- Hypertension. The clinical management of primary hypertension in adults. Appendices. London (UK): National Institute for Health and Clinical Excellence (NICE); 2011 Aug. Various p. (Clinical guideline; no. 127). Electronic copies: Available in PDF from the NICE Web site .
- Hypertension. NICE pathway. London (UK): National Institute for Health and Clinical Excellence (NICE); 2011 Aug. Various pages. (Clinical guideline; no. 127). Electronic copies: Available from the NICE Web site .
- Hypertension. Clinical audit tool. London (UK): National Institute for Health and Clinical Excellence (NICE); 2011. Various p. (Clinical guideline; no. 127). Electronic copies: Available from the NICE Web site .
- Hypertension. Electronic audit tool. London (UK): National Institute for Health and Clinical Excellence (NICE); 2011. Various p. (Clinical guideline; no. 127). Electronic copies: Available from the NICE Web site .
- Hypertension. Costing report. London (UK): National Institute for Health and Clinical Excellence (NICE); 2011. 27 p. (Clinical guideline;

no. 127). Electronic copies: Available in PDF from the NICE Web site.

- Hypertension. Costing template. Implementing NICE guidance. London (UK): National Institute for Health and Clinical Excellence (NICE); 2011. (Clinical guideline; no. 127). Electronic copies: Available from the NICE Web site.
- Hypertension. Slide set. Implementing NICE guidance. London (UK): National Institute for Health and Clinical Excellence (NICE); 2011. 25 p. (Clinical guideline; no. 127). Electronic copies: Available from the NICE Web site.
- Hypertension. Baseline assessment tool. Implementing NICE guidance. London (UK): National Institute for Health and Clinical Excellence (NICE); 2011. (Clinical guideline; no. 127). Electronic copies: Available from the NICE Web site.
- Hypertension. Implementation advice. Implementing the ambulatory blood pressure monitoring recommendations. London (UK): National Institute for Health and Clinical Excellence (NICE); 2011. 32 p. (Clinical guideline; no. 127). Electronic copies: Available in PDF from the NICE Web site.
- Hypertension. Clinical case scenarios for primary care. London (UK): National Institute for Health and Clinical Excellence (NICE); 2011 Aug. 54 p. (Clinical guideline; no. 127). Electronic copies: Available in PDF from the NICE Web site.
- Hypertension. Clinical case scenarios for primary care. Slide set. London (UK): National Institute for Health and Clinical Excellence (NICE); 2011 Aug. 43 p. (Clinical guideline; no. 127). Electronic copies: Available from the NICE Web site.
- Hypertension: implementation podcast focusing on the ABPM recommendations with Professor Williams. Available from the NICE Web site.
- The guidelines manual 2009. London (UK): National Institute for Health and Clinical Excellence (NICE); 2009 Jan. Electronic copies: Available in PDF from the NICE Archive Web site.

Patient Resources

The following is available:

- High blood pressure. Understanding NICE guidance. Information for people with hypertension. London: National Institute for Health and Clinical Excellence (NICE); 2011 Aug. 16 p. Available in Portable Document Format (PDF) from the National Institute for Health and Clinical Excellence (NICE) Web site. Also available in Welsh from the NICE Web site.

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

NGC Status

This NGC summary was completed by ECRI on January 25, 2005. The information was verified by the guideline developer on April 26, 2005. This NGC summary was updated by ECRI Institute on February 24, 2012.

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